

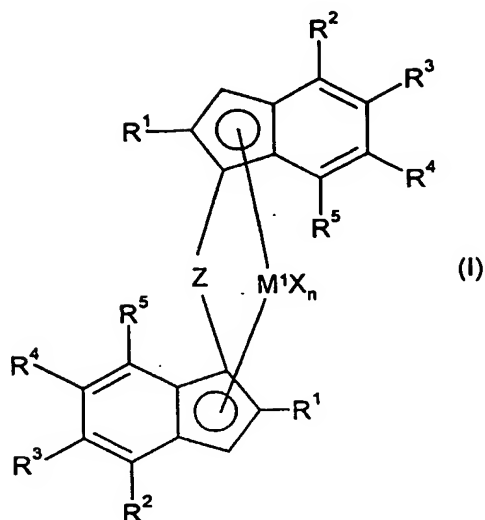
Claims:

1. An organometallic transition metal compound of the formula (I)

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where

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M^1 is an element of group 3, 4, 5 or 6 of the Periodic Table of the Elements or the lanthanides,

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X are identical or different and are each halogen, hydrogen, C_1 - C_{20} -alkyl, C_2 - C_{20} -alkenyl, C_6 - C_{22} -aryl, alkylaryl or arylalkyl each having from 1 to 10 carbon atoms in the alkyl part and from 6 to 22 carbon atoms in the aryl part, $-OR^6$ or $-NR^6R^7$, where two radicals X may also be joined to one another,

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n is a natural number from 1 to 4 which corresponds to the oxidation number of M^1 minus 2,

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R^1 is hydrogen or a C_1 - C_{40} radical,

R^2 is a substituted or unsubstituted C_6 - C_{40} -aryl radical or C_2 - C_{40} -heteroaromatic radical containing at least one heteroatom selected from the group consisting of O, N, S and P,

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R^3 is hydrogen or a C_1 - C_{40} radical,

or the radicals R^2 and R^3 together form a ring system,

R^4 is hydrogen or a C_1 - C_{40} radical,

R^5 is a C_1 - C_{40} radical,

and

Z is a divalent group $CR^8R^9-CR^{10}R^{11}$, where R^8 , R^9 , R^{10} and R^{11} are identical or different and are each hydrogen or a C_1 - C_{40} radical.

2. An organometallic transition metal compound of the formula (I) as claimed in claim 1,

where

M^1 is an element of group 4 of the Periodic Table of the Elements,

n is 2,

R^1 is C_1 - C_{10} -alkyl,

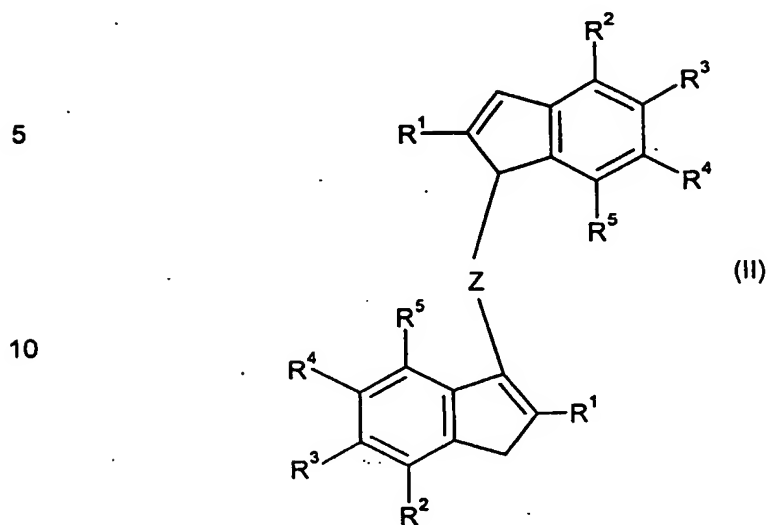
R^3 is hydrogen or a C_1 - C_{10} -alkyl radical,

R^4 is hydrogen or a C_1 - C_{10} -alkyl radical,

R^5 is a C_1 - C_{10} -alkyl radical and

Z is CH_2-CH_2 .

3. A biscyclopentadienyl ligand system of the formula (II)



or its double bond isomers,

where the variables R^1 , R^2 , R^3 , R^4 , R^5 and Z are as defined in formula (I).

20 4. A biscyclopentadienyl ligand system of the formula (II) as claimed in claim 3,

where

- 25
- R^1 is C_1 - C_{10} -alkyl,
- R^3 is hydrogen or a C_1 - C_{10} -alkyl radical,
- R^4 is hydrogen or a C_1 - C_{10} -alkyl radical,
- 30 R^5 is a C_1 - C_{10} -alkyl radical and
- Z is CH_2 - CH_2 .

35 5. A catalyst system for the polymerization of olefins comprising at least one organometallic transition metal compound as claimed in claim 1 or 2 and at least one cocatalyst as cation-forming compound.

6. A catalyst system as claimed in claim 5 which further comprises a support.

7. A process for preparing polyolefins by polymerization or copolymerization of at least one olefin in the presence of a catalyst system as claimed in claim 5 or 6.
8. The use of a biscyclopentadienyl ligand system as claimed in claim 3 or 4 for preparing an organometallic transition metal compound.
9. A process for preparing an organometallic transition metal compound, which comprises reacting a biscyclopentadienyl ligand system as claimed in claim 3 or 4 or a bisanion prepared therefrom with a transition metal compound.